

That Which is Claimed is:

1. A coaxial cable, comprising:

a metallic inner conductor formed of a first material and having a first thickness;

a dielectric layer circumferentially surrounding the inner conductor formed of a

5 second material and having a second thickness;

a metallic outer conductor circumferentially surrounding the dielectric layer formed of a third material and having a third thickness; and

a polymeric jacket circumferentially surrounding the outer conductor formed of a fourth material and having a fourth thickness;

10 wherein at least one of the first material, first thickness, second material, second thickness, third material, third thickness, fourth material and fourth thickness is selected so that the cable has:

(a) a usable bandwidth between about 5 MHz and the cut-off frequency of the cable;

15 (b) a minimum bend radius of less than about 5 times the jacket outer diameter; and

(c) a velocity of propagation of greater than about 88.

2. The coaxial cable defined in Claim 1, wherein at least one of the first material, first thickness, second material, second thickness, third material, third thickness, fourth material and fourth thickness is further selected so that the cable has a continuous usable bandwidth above about 1.0 GHz.

3. The coaxial cable defined in Claim 1, wherein at least one of the first material, first thickness, second material, second thickness, third material, third thickness, fourth material and fourth thickness is further selected so that the cable has a continuous bandwidth above about 3.0 GHz.

4. The coaxial cable defined in Claim 1, wherein at least one of the first material, first thickness, second material, second thickness, third material, third thickness, fourth material and fourth thickness is further selected so that the cable has a return loss of at least about -15db.

5 5. The coaxial cable defined in Claim 1, wherein at least one of the first material, first thickness, second material, second thickness, third material, third thickness, fourth material and fourth thickness is further selected so that the cable has a return loss of at least about -25db.

10 6. The coaxial cable defined in Claim 1, wherein at least one of the first material, first thickness, second material, second thickness, third material, third thickness, fourth material and fourth thickness is further selected so that the cable has a nominal impedance of 75 ohms.

15 7. The coaxial cable defined in Claim 1, wherein at least one of the first material, first thickness, second material, second thickness, third material, third thickness, fourth material and fourth thickness is further selected so that the cable has a nominal impedance of 50 ohms.

20 8. The coaxial cable defined in Claim 1, wherein at least one of the first material, first thickness, second material, second thickness, third material, third thickness, fourth material and fourth thickness is further selected so that the cable has an attenuation spike due to return loss within the usable bandwidth.

 9. The coaxial cable defined in Claim 1, wherein the cable has a length of at least 1,000 feet.

25 10. The coaxial cable defined in Claim 1, wherein the first material is selected from the group consisting of: copper; aluminum and steel clad with copper; and aluminum, copper and steel clad with silver.

30 11. The coaxial cable defined in Claim 1, wherein the second material is a foamed polymeric material.

12. The coaxial cable defined in Claim 11, wherein the dielectric layer has a density gradient across its cross-section such that density increases with increasing radial distance from the conductor.

5 13. The coaxial cable defined in Claim 1, wherein the third material is selected from the group consisting of solid copper and solid aluminum.

14. The coaxial cable defined in Claim 1, wherein a corrosion-resistant material is interposed between the outer conductor and the jacket.

10 15. The coaxial cable defined in Claim 16, wherein the corrosion-resistant material is a dry material.

15 16. The coaxial cable defined in Claim 1, wherein the cable withstands at least 5 cycles in reverse bend fatigue tests.

17. The coaxial cable defined in Claim 1, wherein the dielectric layer can be cored from the cable with a conventional coring tool such that less than a 360 degree residue remains on the inner surface of the outer conductor.

20 18. A coaxial cable, comprising:
a metallic inner conductor formed of a first material and having a first thickness;
a dielectric layer circumferentially surrounding the inner conductor formed of a
25 a metallic outer conductor circumferentially surrounding the dielectric layer formed of a third material and having a third thickness; and
a polymeric jacket circumferentially surrounding the outer conductor formed of a fourth material and having a fourth thickness;
wherein at least one of the first material, first thickness, second material, second
30 thickness, third material, third thickness, fourth material and fourth thickness is selected so that the dielectric layer can be cored from the cable with a standard coring tool such that less

than a 360 degree residue remains on the inner surface of the outer conductor and so that the cable has:

- (a) a usable bandwidth between about 5 MHz and the cut-off frequency of the cable; and
- 5 (b) a minimum bend radius of less than about 5 times the jacket outer diameter.

19. The coaxial cable defined in Claim 18, wherein at least one of the first material, first thickness, second material, second thickness, third material, third thickness, fourth material and fourth thickness is further selected so that the cable has a continuous
10 usable bandwidth above about 1.0 GHz.

20. The coaxial cable defined in Claim 18, wherein at least one of the first material, first thickness, second material, second thickness, third material, third thickness, fourth material and fourth thickness is further selected so that the cable has a continuous
15 bandwidth above about 3.0 GHz.

21. The coaxial cable defined in Claim 18, wherein at least one of the first material, first thickness, second material, second thickness, third material, third thickness, fourth material and fourth thickness is further selected so that the cable has a return loss of at
20 least about -15db.

22. The coaxial cable defined in Claim 18, wherein at least one of the first material, first thickness, second material, second thickness, third material, third thickness, fourth material and fourth thickness is further selected so that the cable has a return loss of at
25 least about -25db.

23. The coaxial cable defined in Claim 18, wherein at least one of the first material, first thickness, second material, second thickness, third material, third thickness, fourth material and fourth thickness is further selected so that the cable has a nominal
30 impedance of 75 ohms.

24. The coaxial cable defined in Claim 18, wherein at least one of the first material, first thickness, second material, second thickness, third material, third thickness, fourth material and fourth thickness is further selected so that the cable has a nominal impedance of 50 ohms.

25. The coaxial cable defined in Claim 18, wherein at least one of the first material, first thickness, second material, second thickness, third material, third thickness, fourth material and fourth thickness is further selected so that the cable has an attenuation spike due to return loss within the usable bandwidth.

26. The coaxial cable defined in Claim 18, wherein the cable has a length of at least 1,000 feet.

27. The coaxial cable defined in Claim 18, wherein the first material is selected from the group consisting of: copper; aluminum and steel clad with copper; and aluminum, copper and steel clad with silver.

28. The coaxial cable defined in Claim 18, wherein the second material is a foamed polymeric material.

29. The coaxial cable defined in Claim 28, wherein the dielectric layer has a density gradient across its cross-section such that density increases with increasing radial distance from the conductor.

30. The coaxial cable defined in Claim 18, wherein the third material is selected from the group consisting of solid copper and solid aluminum.

31. The coaxial cable defined in Claim 18, wherein a corrosion-resistant material is interposed between the outer conductor and the jacket.

32. The coaxial cable defined in Claim 31, wherein the corrosion-resistant material is a dry material.

33. The coaxial cable defined in Claim 18, wherein the cable withstands at least 5 cycles in reverse bend fatigue tests.

5 34. A coaxial cable, comprising:
a metallic inner conductor formed of a first material and having a first thickness;
a dielectric layer circumferentially surrounding the inner conductor formed of a
second material and having a second thickness;
a metallic outer conductor circumferentially surrounding the dielectric layer formed of
10 a third material and having a third thickness; and
a polymeric jacket circumferentially surrounding the outer conductor formed of a
fourth material and having a fourth thickness;
wherein at least one of the first material, first thickness, second material, second
thickness, third material, third thickness, fourth material and fourth thickness is selected so
15 that the dielectric layer can be cored from the cable with a standard coring tool such that less
than a 360 degree residue remains on the inner surface of the outer conductor and so that the
cable has:

(a) a usable bandwidth between about 5 MHz and the cut-off frequency of the
cable; and

20 (b) a velocity of propagation of greater than about 88 percent.

35. The coaxial cable defined in Claim 34, wherein at least one of the first
material, first thickness, second material, second thickness, third material, third thickness,
fourth material and fourth thickness is further selected so that the cable has a continuous
25 usable bandwidth above about 1.0 GHz.

36. The coaxial cable defined in Claim 34, wherein at least one of the first
material, first thickness, second material, second thickness, third material, third thickness,
fourth material and fourth thickness is further selected so that the cable has a continuous
30 bandwidth above about 3.0 GHz.

37. The coaxial cable defined in Claim 34, wherein at least one of the first material, first thickness, second material, second thickness, third material, third thickness, fourth material and fourth thickness is further selected so that the cable has a return loss of at least about -15db.

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38. The coaxial cable defined in Claim 34, wherein at least one of the first material, first thickness, second material, second thickness, third material, third thickness, fourth material and fourth thickness is further selected so that the cable has a return loss of at least about -25db.

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39. The coaxial cable defined in Claim 34, wherein at least one of the first material, first thickness, second material, second thickness, third material, third thickness, fourth material and fourth thickness is further selected so that the cable has a nominal impedance of 75 ohms.

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40. The coaxial cable defined in Claim 34, wherein at least one of the first material, first thickness, second material, second thickness, third material, third thickness, fourth material and fourth thickness is further selected so that the cable has a nominal impedance of 50 ohms.

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41. The coaxial cable defined in Claim 34, wherein at least one of the first material, first thickness, second material, second thickness, third material, third thickness, fourth material and fourth thickness is further selected so that the cable has an attenuation spike due to return loss within the usable bandwidth.

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42. The coaxial cable defined in Claim 34, wherein the cable has a length of at least 1,000 feet.

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43. The coaxial cable defined in Claim 34, wherein the first material is selected from the group consisting of: copper; aluminum and steel clad with copper; and aluminum, copper and steel clad with silver.

44. The coaxial cable defined in Claim 34, wherein the second material is a foamed polymeric material.

45. The coaxial cable defined in Claim 44, wherein the dielectric layer has a density gradient across its cross-section such that density increases with increasing radial distance from the conductor.

46. The coaxial cable defined in Claim 34, wherein the third material is selected from the group consisting of solid copper and solid aluminum.

47. The coaxial cable defined in Claim 34, wherein a corrosion-resistant material is interposed between the outer conductor and the jacket.

48. The coaxial cable defined in Claim 47, wherein the corrosion-resistant material is a dry material.

49. The coaxial cable defined in Claim 34, wherein the cable withstands at least 5 and cycles in reverse bend fatigue tests.

50. A hybrid fiber cable (HFC) network, comprising:
two coaxial cables as defined in one of Claims 1, 18 and 34; and
an optical fiber in communication with the coaxial cable, wherein together the coaxial cable and the optical fiber define a transmission path.

51. The HFC network defined in Claim 50, wherein the optical fiber has a zero dispersion wavelength of about 1310 nm, a loss at 1385 nm that is less than its loss at 1310 nm and a chromatic dispersion of between 1.5 and 8.0 ps/nm-km in the 1.4 μ m wavelength region.

52. The HFC network defined in Claim 50, further comprising a multiplexer in communication with the optical fiber.

53. The HFC network defined in Claim 50, further comprising a wave-division multiplexer in communication with the optical fiber.

54. The HFC network defined in Claim 50, wherein the optical fiber extends at
5 least 10 kilometers along the travel path.

55. A hybrid fiber cable (HFC) network, comprising:
two coaxial cables as defined in one of Claims 1, 18 and 34; and
an optical fiber in communication with the coaxial cable, wherein together the coaxial
10 cable and the optical fiber define a transmission path, and wherein the optical fiber is in
communication with the coaxial cables at a node.

56. The HFC network defined in Claim 50, wherein the coaxial cable is a nominal
75 ohm coaxial cable.

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